

WHAT IS CLAIMED IS:

1. A method for aerosolizing a substance, the method comprising:
supplying a liquid to a cartridge having a substance which is in a dry state,
wherein the substance is dissolved into the liquid to form a solution;
transferring the solution from the cartridge and onto an atomization
member; and
operating the atomization member to aerosolize the solution.
2. A method as in claim 1, further comprising introducing the substance
into the cartridge while in a liquid state, and further comprising lyophilizing the substance
to place the substance in the dry state.
3. A method as in claim 1, further comprising supplying the liquid from a
liquid dispenser that is coupled to the cartridge.
4. A method as in claim 3, wherein the substance is disposed in a support
structure, and further comprising forcing the liquid through the support structure with the
dispenser to transfer to solution to the atomization member.
5. A method as in claim 1, further comprising vibrating the atomization
member to aerosolize the solution.
6. A method as in claim 3, further comprising removing the cartridge from
the liquid dispenser following dispensing and discarding the cartridge.
7. A method as in claim 6, further comprising dispensing additional liquid
from the dispenser onto the atomization member following removal of the cartridge, and
operating the atomization member to clean the atomization member.
8. An aerosolizing system, comprising:
a liquid dispenser which is adapted to deliver a volume of liquid upon
operation of the liquid dispenser;
a cartridge to receive liquid from the liquid dispenser, the cartridge
comprising a housing having a substance which is in a dry state, wherein receipt of the
volume of liquid from the liquid dispenser dissolves the substance to form a solution; and

an aerosol generator disposed near the cartridge and which is adapted to receive the solution from the cartridge.

9. A system as in claim 8, wherein the housing includes a support structure and wherein the substance is disposed in the support structure.

10. A system as in claim 9, wherein the support structure comprises an open cell porous material.

11. A system as in claim 9, wherein the cartridge has an inlet opening and an outlet opening, and further comprising a coupling mechanism at the inlet opening to couple the cartridge to the liquid dispenser.

12. A system as in claim 11, wherein the cartridge further includes a filter near the inlet opening and a filter near the outlet opening, and wherein the support structure is disposed between the filters.

13. A method for aerosolizing a substance, the method comprising:
transferring a liquid from a first chamber into a second chamber having a substance in a dry state to form a solution;
transferring the solution from the second chamber onto an atomization member; and
operating the atomization member to aerosolize the solution.

14. A method as in claim 13, wherein the first and the second chambers are disposed in a cartridge, and further comprising moving a piston through the first chamber to transfer the liquid to the second chamber.

15. A method as in claim 14, further comprising positioning a divider between the first and the second chamber at a home position to hold the liquid in the first chamber.

16. A method as in claim 15, wherein the cartridge includes at least one groove disposed at least part way between the first and second chambers, and further comprising moving the piston toward the divider to move the divider away from the home position and to allow the liquid in the first chamber to pass around the divider, through the groove and into the second chamber.

17. A method as in claim 16, wherein the groove terminates at the second chamber, and further comprising moving the piston against the divider and into the second chamber to force the solution from the second chamber and out the exit opening.

18. A method as in claim 16, further comprising withdrawing the piston from the first chamber to draw the solution from the second chamber and into the first chamber, and then moving the piston through the first chamber and into the second chamber to force the solution out the exit opening.

19. A method as in claim 13 further comprising vibrating the atomization member to aerosolize the solution.

20. A method as in claim 14, wherein the cartridge is held in a housing of an inhaler, and further comprising removing the cartridge from the housing following dispensing and discarding the cartridge.

21. A method as in claim 20, further comprising introducing a cleaning cartridge into the housing and dispensing a cleaning solution from the cleaning cartridge onto the atomization member, and operating the atomization member to clean the atomization member.

22. An aerosolizing apparatus, comprising:

a cartridge having a first chamber, a second chamber, a movable divider between the first and the second chambers, and an exit opening in communication with the second chamber, wherein a liquid is disposed in the first chamber and a substance that is in a dry state is in the second chamber;

a piston translatable within the cartridge to transfer the liquid from the first chamber and into the second chamber to form a solution; and

an aerosol generator disposed near the exit opening to receive the solution from the cartridge and produce an aerosolized solution.

23. An apparatus as in claim 22, wherein the divider has a home position where a seal is formed between the divider and the cartridge to hold the liquid in the first chamber.

24. An apparatus as in claim 23, wherein the cartridge includes at least one groove disposed at least part way between the first and second chambers to allow the liquid in the first chamber to pass around the divider and into the second chamber when the divider is moved away from the home position and toward the second chamber.

25. An apparatus as in claim 24, wherein the groove terminates at the second chamber so that when the piston moves the divider into the second chamber, a seal is formed between the cartridge and the divider to force the solution from the second chamber and out the exit opening.

26. An apparatus as in claim 22, further comprising a filter disposed across the exit opening.

27. An apparatus as in claim 22, further comprising a motor to translate the piston.

28. An apparatus as in claim 27, wherein the cartridge is cylindrical in geometry.

29. An apparatus as in claim 22, wherein the substance is selected from the group of substances consisting of proteins, peptides, small molecule chemical entities, genetic materials, macromolecules and small molecules.

30. An apparatus as in claim 22, wherein the cartridge and the aerosol generator as disposed in a housing.

31. An apparatus as in claim 22, wherein the aerosol generator includes a plate having a plurality of tapered apertures, and wherein the plate is constructed from materials selected from a group consisting of palladium-nickel alloys and gold.